

CLAIMS

What is Claimed is:

1. A startup code for protecting a shelled computer program, comprising:
a sequence of tasks collectively executing the startup code; and
5 wherein at least one task is selectably performed by a selected one of a plurality
of task code variations as selected by a selection code associated with the at least one
task.
2. The startup code of claim 1, wherein the selected one of the plurality task
10 code variations is pseudorandomly selected.
3. The startup code of claim 1, wherein the selected one of the plurality of
task code variations are selected based on a function of time.
- 15 4. The startup code of claim 1, wherein the selected one of the plurality of
task code variations is selected based on a function of one or more parameters describing
a computer executing the startup code.
5. The startup code of claim 4, wherein the one or more parameters
20 includes a computer fingerprint.
6. The startup code of claim 1, wherein a second task of the sequence of
tasks is selectably performed by a selected one of a plurality of second task code
variations as selected by a second selection code associated with second task.
25
7. The startup code of claim 1, wherein a second task of the sequence of
tasks is selectably performed by a selected one of a plurality of second task code
variations as selected by a second selection code associated with the selected task code
variation.
30
8. The startup code of claim 7, wherein the selected one of the plurality of
second task code variations is pseudorandomly selected.

9. The startup code of claim 7, wherein the selected one of the plurality of second task code variations is selected based on a function of time.

10. The startup code of claim 7, wherein the selected one of the plurality of second task code variations is selected based on a function of one or more parameters describing a computer executing the startup code.

11. The startup code of claim 10, wherein the one or more parameters includes a computer fingerprint.

12. A startup code for protecting a shelled computer program, comprising:
a plurality N of startup code tasks T_1, T_2, \dots, T_N to be performed to execute the startup code;
a plurality K of startup task code variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ for at least one T_i of the plurality startup code tasks T_1, T_2, \dots, T_N ; and
a selection routine S_i for the at least one T_i of the plurality of startup code tasks T_1, T_2, \dots, T_N , the selection routine S_i for selecting at least one T_{ij} of the K plurality of code variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ from among the plurality of code variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$.

13. The startup code of claim 12, wherein the startup code tasks are to be performed in series.

14. The startup code of claim 12, wherein the selection routine pseudorandomly selects the one of the plurality of code variations from among the plurality of code variations.

15. The startup code of claim 12, wherein the selection routine selects one of the plurality of code variations from among the plurality of code variations according to a function of time.

16. The startup code of claim 12, wherein the selection routine selects one of the plurality of code variations from among the plurality of code variations according to a function of one or more parameters describing a computer executing the startup code.

5 17. The startup code of claim 16, wherein the one or more parameters includes a computer fingerprint.

18. The startup code of claim 12, further comprising:
a plurality K of second selection routines $S_{i+1,1}$, $S_{i+1,2}$, ... $S_{i+1,K}$ each second selection
10 routine $S_{i+1,1}$, $S_{i+1,2}$, ... $S_{i+1,K}$ associated with and executed after one of the plurality of
startup code variations $T_{i,K}$, and each second selection routine $S_{i+1,1}$, $S_{i+1,2}$, ... $S_{i+1,K}$ for
selecting at least one of a plurality of L second startup code variations $T_{i+1,1}$, $T_{i+1,2}$, ... ,
 $T_{i+1,L}$, for a second startup code task T_{i+1} of the plurality of startup code tasks T_1 , T_2 , ...
, T_N .

15

19. The startup code of claim 18, wherein each of the plurality of second selection routines pseudorandomly selects the one of the plurality of second startup code variations from among the plurality of second startup code variations.

20 20. The startup code of claim 18, wherein each of the plurality of second selection routines selects one of the plurality of second startup code variations from among the plurality of second startup code variations according to a function of time.

21. The startup code of claim 18, wherein each of the plurality of second
25 selection routines selects one of the plurality of second startup code variations from among the plurality of second startup code variations according to a function of one or more parameters describing a computer executing the startup code.

22. The startup code of claim 21, wherein the one or more parameters
30 includes a computer fingerprint.

23. A method of generating a secure startup code for use in generating a shelled application program, comprising the steps of:

generating a plurality N of startup task routines T_1, T_2, \dots, T_N collectively forming the startup code;

5 generating a plurality K of startup task routine variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ for a chosen startup task routine T_i of the startup task routines T_1, T_2, \dots, T_N ;

generating a selection routine S_i for the chosen startup task routine T_i of the startup task routines T_1, T_2, \dots, T_N , each selection routine S_i for selecting at least one of the startup task code variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ to perform the chosen startup task
10 routine T_i ; and

assembling the secure startup code as a combination of the plurality of task routines T_1, T_2, \dots, T_N for the unchosen ones of the plurality of task routines, and the selection routine S_i and plurality of task routine variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ for each of the chosen task routine T_i of the plurality task routines T_1, T_2, \dots, T_N .

15

24. The method of claim 23, further comprising the step of separating the startup code into a series of task routines T_1, T_2, \dots, T_N .

25. The method of claim 23, wherein the selection routine S_i
20 pseudorandomly selects the one of the plurality of startup task routine variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$.

26. The method of claim 23, wherein the selection routine S_i selects the one of the plurality of startup routine variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ as a function of time.

25

27. The method of claim 23, wherein the selection routine S_i selects the one of the plurality of startup routine variations $T_{i,1}, T_{i,2}, \dots, T_{i,K}$ as a function of one or more parameters describing a computer executing the startup code.

30 28. The method of claim 27, wherein the one or more parameters includes a computer fingerprint.

29. The method of claim 23, wherein:

the method further comprises the steps of generating a plurality K second selection routines, each second selection routine $S_{i+1,1}, S_{i+1,2}, \dots, S_{i+1,K}$ associated with and executed after one of the plurality of startup code variations $T_{i,K}$, and each second selection routine $S_{i+1,1}, S_{i+1,2}, \dots, S_{i+1,K}$ for selecting at least one of a plurality of L second startup code variations $T_{i+1,1}, T_{i+1,2}, \dots, T_{i+1,L}$ for a second startup task routine T_{i+1} of the plurality of startup task routines T_1, T_2, \dots, T_N ; and

the secure startup code is assembled as a combination of the plurality of task routines for the unchosen ones of the plurality of task routines T_1, T_2, \dots, T_N , the selection routine S_i and plurality of task routine variations $T_{i,1}, T_{i,2}, \dots, T_{i,L}$ for each of the chosen ones of the task routines T_1, T_2, \dots, T_N , and the second selection routines $S_{i+1,1}, S_{i+1,2}, \dots, S_{i+1,K}$ and second startup code variations $T_{i+1,1}, T_{i+1,2}, \dots, T_{i+1,L}$.

30. A method of executing a secure startup code, comprising the steps of:

selecting a startup task code variation from among a plurality of startup task code variations, each startup code task variation performing a startup code task differently than the other startup code task variations, the startup code task belonging to a sequence of startup code tasks collectively performing the startup code; and executing the selected startup task code variation.

31. The method of claim 30, wherein the startup task code variation is pseudorandomly selected.

32. The method of claim 30, wherein the startup task code variation is selected based on a function of time.

33. The method of claim 30, wherein the startup task code is selected as a function of one or more parameters describing a computer executing the startup code.

34. The method of claim 33, wherein the one or more parameters includes a computer fingerprint.

35. The method of claim 30 above, further comprising the steps of:
selecting a second startup task code variation from among a plurality of second
startup task code variations, each second startup code task variation performing a second
startup code task differently than the other second startup code task variations, the
5 second startup code task belonging to the sequence of startup code tasks collectively
performing the startup code; and
executing the selected second startup task code variation.

36. The method of claim 35, wherein the step of selecting the second startup
10 task code variation is performed by executing a selection routine associated each of the
startup code task variations and the second startup code task variations.

37. The method of claim 35, wherein the step of selecting the second startup
task code variation is performed by executing a selection routine associated with the
15 selected startup task code variation and the second startup task code variations.